

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

December 4, 2012

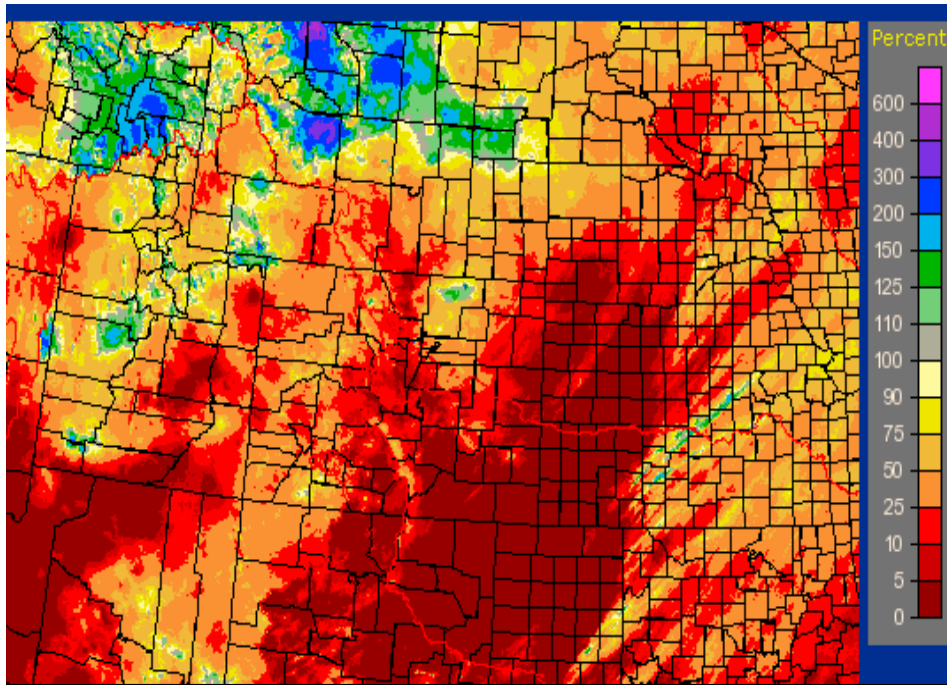


Fig. 1: November precipitation as a percent of average.

Precipitation

For the month of November, most of the Upper Colorado River Basin (UCRB) received below average precipitation (Fig. 1). The Wasatch and Uintah ranges in Utah received between 2 and 3 inches for the month, while much of the higher elevations of western Colorado and southwest Wyoming received between .5 and 1.5 inches. This is below normal for this time of year though and most of the basin saw between 10% and 50% of average precipitation. East of the basin, the rest of CO was very dry, with most of eastern CO receiving less than .5 inches for the month and between 0% and 25% of the normal moisture received for November.

Accumulated snowpack is currently much less than average on the east side of the UCRB and slightly below average on the west side of the basin (Fig. 2). Sub-basins in western CO and along the Colorado River valley in eastern UT are all between 15% and 45% of average snowpack. Northeast UT and southwest WY basins are around 80% to 100% of average snowpack. With warmer than average temperatures, there is a risk that the snowpack that has built up could possibly melt back down.

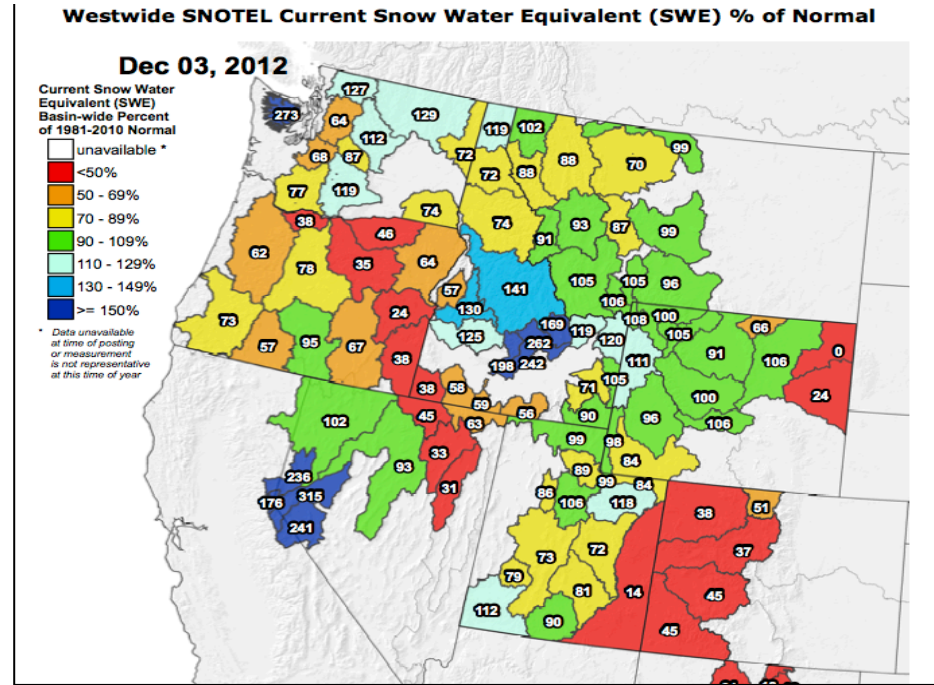
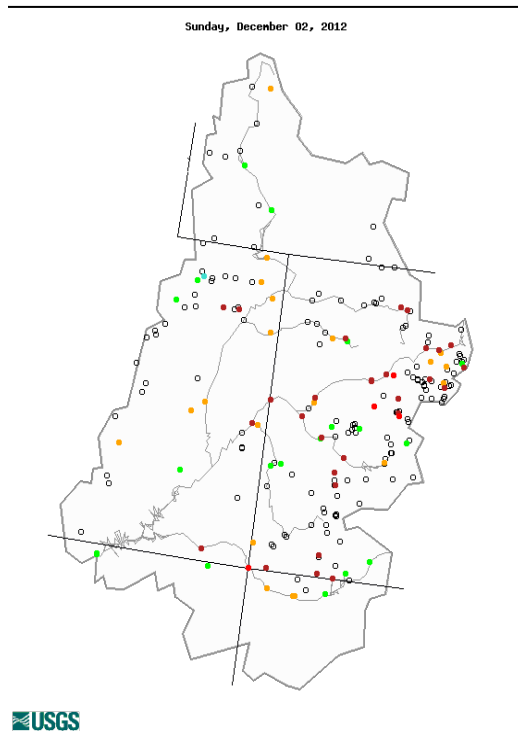


Fig. 2: Basin-averaged snow water equivalent as a percent of average, as of December 3rd.

Streamflow

As of December 2nd, about 27% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 3). About 45% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows, and only one gage recorded above normal flows. Much below normal flows are concentrated around the Colorado River headwaters in CO and along the lower San Juan River. The best conditions (near normal) are concentrated around the Upper Green River. Many of the gages are under frozen conditions and the number of reporting sites has decreased from 130 gages one month ago to 73 gages.

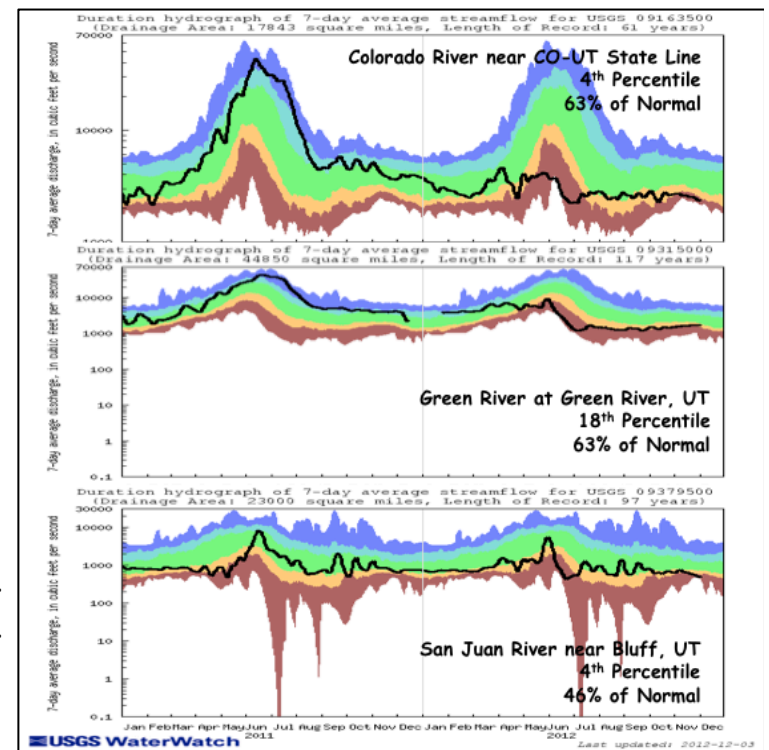
Flows on the three key gages around the basin changed very little from the previous week (Fig. 4). Flows on the Colorado River near the CO-UT state line and on the San Juan River near Bluff, UT are both in the much below normal range and both at the 4th percentile. Flows on the Green River at Green River, UT are in the below normal range, at the 18th percentile.



Explanation - Percentile classes							
●	●	●	●	●	●	○	
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 3: 7-day average discharge compared to historical discharge for December 2nd.

Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



Water Supply and Demand

For the month of November, all of the UCRB saw warmer than average temperatures. Temperatures on the north side of the basin ranged from 4 to 8 degrees above average while the southern portion saw temperatures 2 to 6 degrees above average. East of the basin, the rest of CO saw temperatures 2 to 6 degrees warmer than average. The VIC soil moisture model shows dry soils through most of WY, with soil dryness below the 20th percentile in northeast UT and northwest CO (Fig. 5). When modeled soil moisture is combined with snowpack (Fig. 5) northwest CO shows dryness below the 5th percentile, while northeast UT shows dryness below the 10th percentile. Dry soils also show up in southeast CO with near normal soil moisture in north-central CO and in the San Luis Valley in southern CO.

Last month, many of the major reservoirs in the UCRB saw smaller volume decreases than what is normal for this time of year, with Flaming Gorge staying near steady and Lake Granby seeing a slight increase. Dillon, Lake Powell, and McPhee saw larger decreases than what is normal for this time of year. Most of the reservoirs are between 60% and 80% of their December averages and around 60% to 80% of last year's volumes.

Precipitation Forecast

The UCRB will come underneath increasingly moist flow from the Pacific as a persistent area of low pressure continues to spin off the west coast through much of the week. Several weak disturbances moving through will combine with the available moisture to produce periods of light snow across the higher terrain, with activity increasing from north to south as the jet stream begins to sag southward through the week. The strongest of these disturbances is expected to arrive sometime on Wednesday, with snow gradually tapering off on Thursday. At this time it appears that liquid accumulations of 0.50 are possible across the mountains of the Park, Gore, Elk and Uintah ranges by Friday morning, possibly exceeding 0.75 inches in isolated areas of northern CO (Fig. 6). Liquid accumulations will likely remain at or below 0.25 inches in the central and southern mountains for this period. A bigger pattern change may be in store late this weekend as forecast models show a robust trough forming over the Great Basin on Sunday. While significant uncertainty still exists with the evolution of this storm, expect to see a continuation of unsettled weather persisting well into next week along with a chance of much needed precipitation.

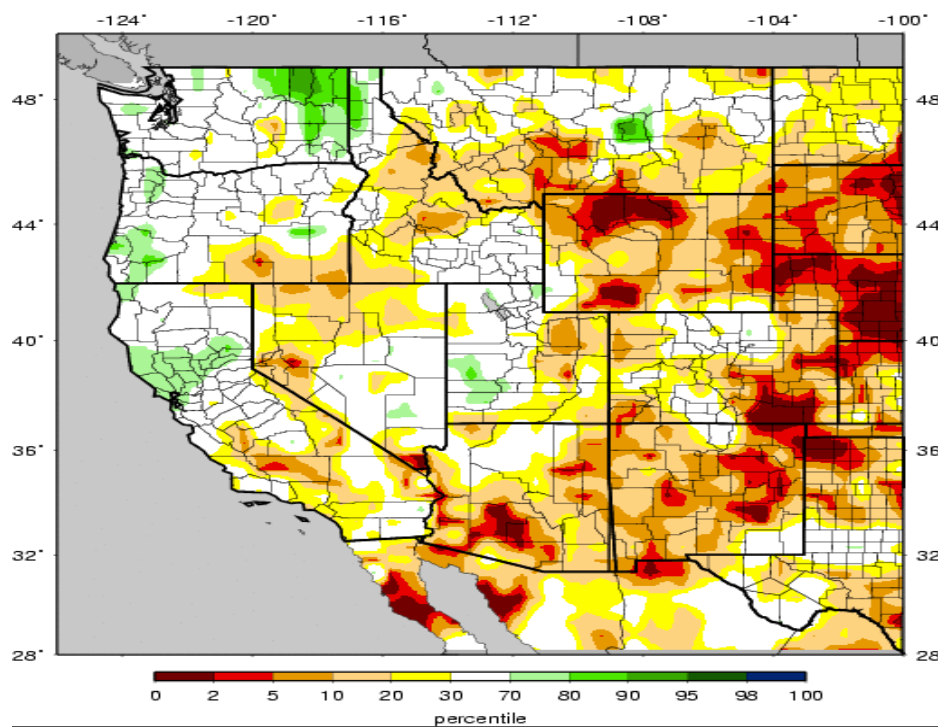


Fig. 5: VIC modeled soil moisture percentiles for the western U.S. as of December 2nd. The map below combines soil moisture and SWE.

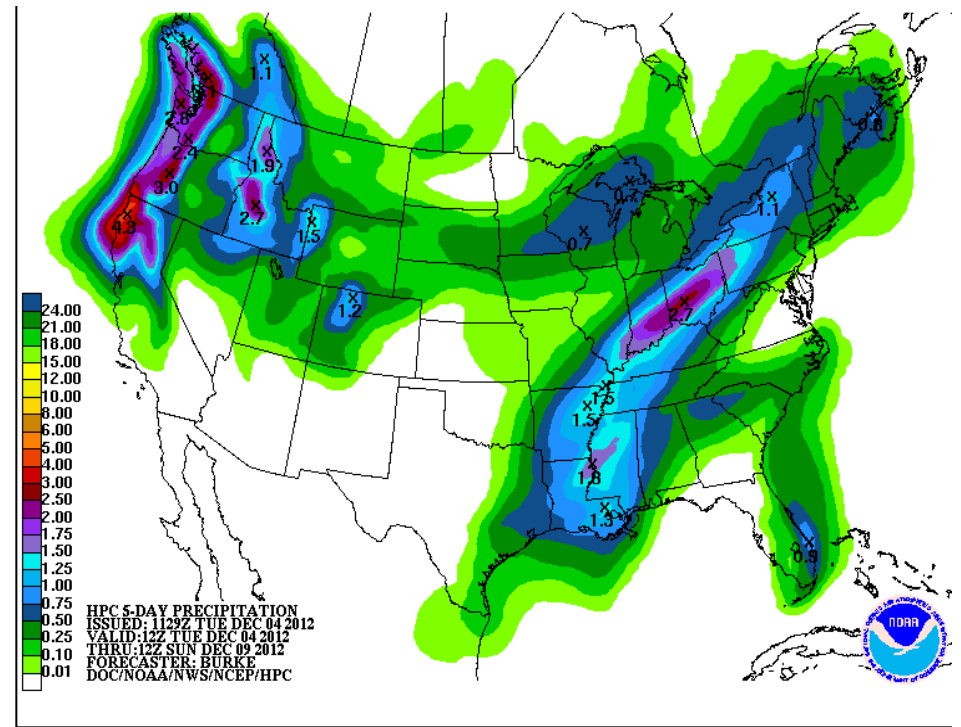
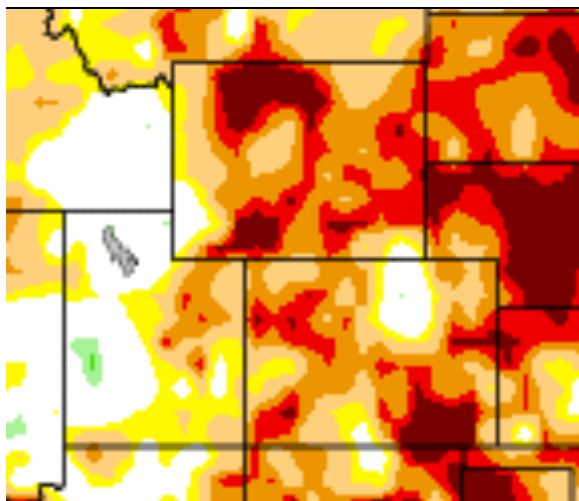


Fig. 6: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Saturday.

Drought and Water Discussion

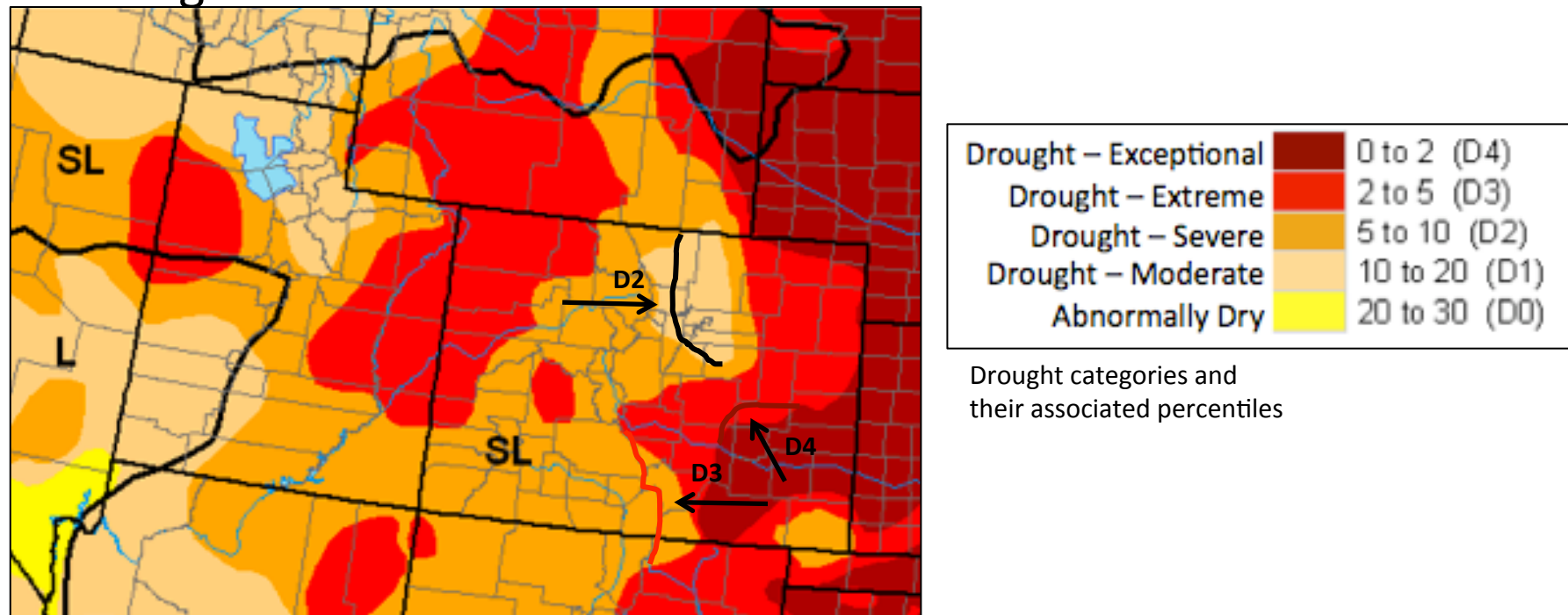


Fig. 7: November 27th release of U.S. Drought Monitor for the UCRB.

UCRB: Status quo is recommended in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 7). Very little snow has accumulated, temperatures have been above average, and there are water year precipitation and snowpack deficits. However, it is still very early in the season, winter recreation impacts are minimal at this point, and the consensus is that the severity depicted (from previous long-term conditions) is sufficient for the short-term as well.

Eastern CO: Based on very dry conditions for the start of the new water year, further deteriorations are recommended. Immediately east of the Continental Divide, a further expansion of D2 is recommended for the higher elevations throughout Larimer, Boulder, Gilpin and Jefferson counties (Fig. 7, black line). In southern CO, the Sangre de Cristos should be added to the D3, but should not expand into the San Luis Valley (Fig. 7, red line). Also, based on poor growth of winter wheat and very little recent moisture, D4 should be expanded slightly across the southern tier of Lincoln County (Fig. 7, maroon line).